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H04N 9/31

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(71) Applicant: MATSUSHITA ELECTRIC IND CO LTD

(22) Date of filing: 27.03.90

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WATABE HIROSHI
YOKOYAMA KAZUO

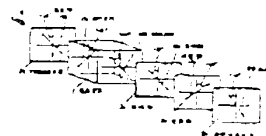
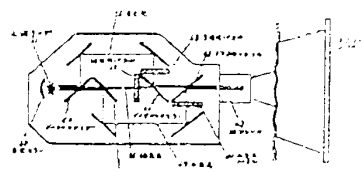
(30) Priority: 29.03.89 JP 64 78845

(54) PROJECTION TYPE LIQUID CRYSTAL DISPLAY DEVICE

(57) Abstract:

PURPOSE: To obtain bright images of a high contrast by adopting the constitution in which the orienting direction of a liquid crystal cell substrate, the phase delay axis of a phase plate and the setting angle of the light shielding axis of a polarizing means or the retardation value of the phase plate vary with each of optical constitution.

CONSTITUTION: The white light emitted from a light source lamp 51 is separated by dichroic mirrors 53, 54 to blue, green and red light rays 55 to 57 which are made incident to 3 sheets of liquid crystal panels 58 to 60. Each of the liquid crystal panels 58 to 60 is constituted of two sheets of polarizing plates 2, the liquid crystal cell 1 and two sheets of the phase plates 3. Two sheets of the phase plates 3 are disposed between the liquid crystal cell 1 and an exit side polarizing plate 2b. The constitution in which the setting angle of the optical axis and the value of the retardation are varied with each of the colors is adopted in this case. The transmittance is, therefore, sufficiently low in the wavelength region corresponding to the intensity distribution of the incident light on the respective panels and the good light shielding characteristics are obtained. The bright images having the high contrast are obtained in this way.



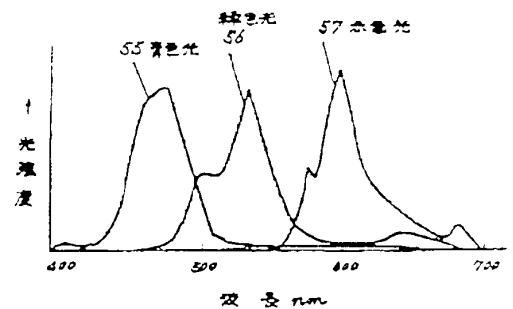
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の投射型液晶表示装置にもちいる一般的な液晶パネルの暗表示時の分光透過率特性図、第1図は従来の前面投影型液晶表示装置の液晶パネルに入射する光の分光特性図である。

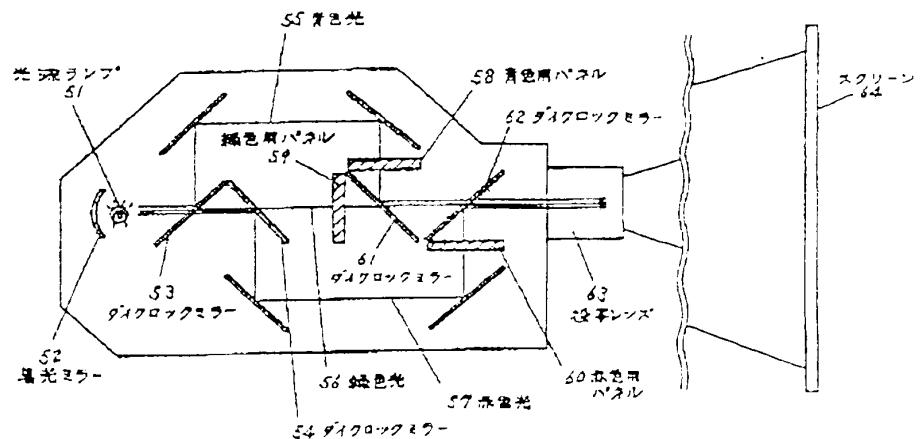
1・・・TNセル、2・・・偏光板、3・・・位相板、11a・・・入射側配向方向、11b・・・出射側配向方向、12a・・・入射側偏光板透過軸方向、12b・・・出射側偏光板透過軸方向、13a、13b・・・進相軸方向、58・・・青色用パネル、59・・・緑色用パネル、60・・・赤色用パネル。

代理人の氏名 弁理士 栗野重幸 ほか1名

第2図



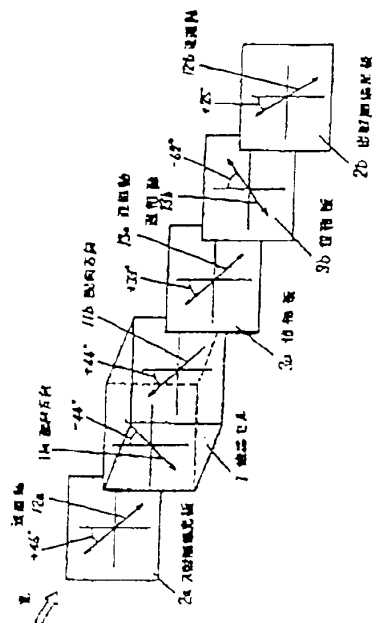
第1図



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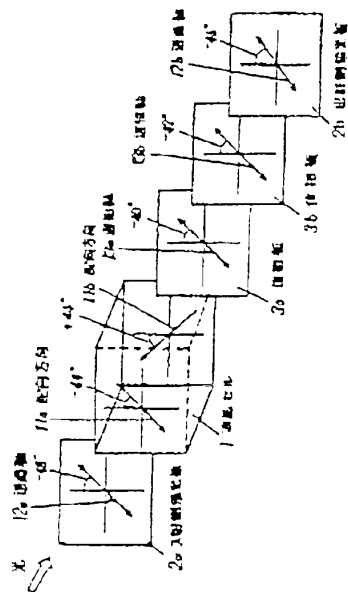
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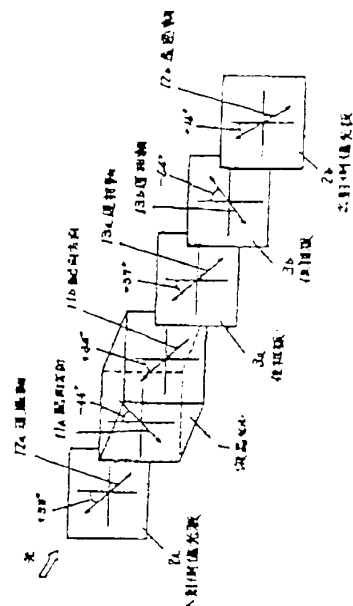


五三

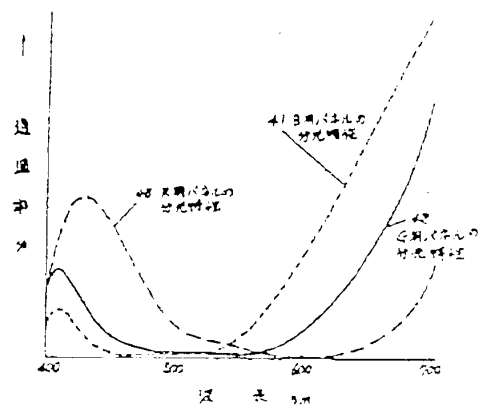
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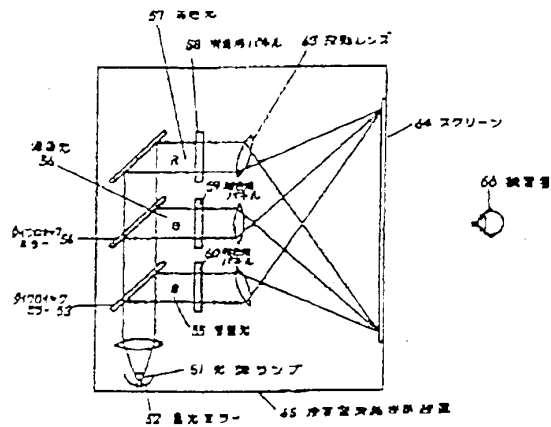


第 4 章

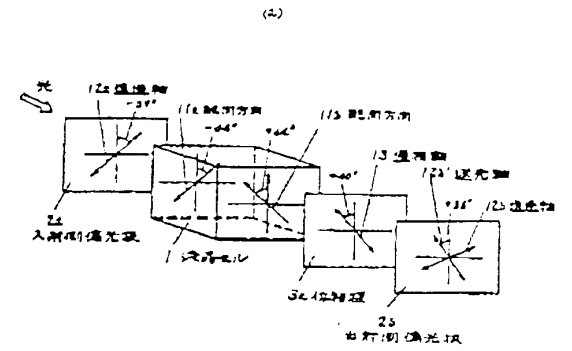


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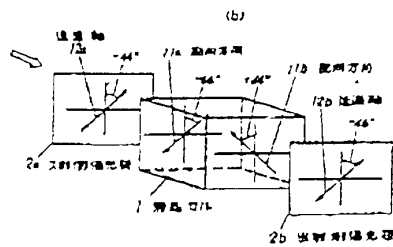
第 5 図



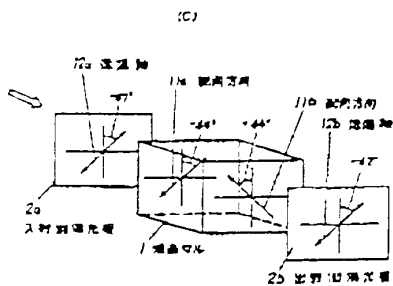
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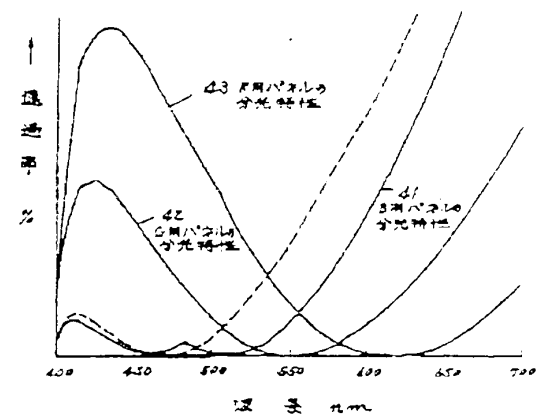
第 6 図



第 6 図



第 7 図



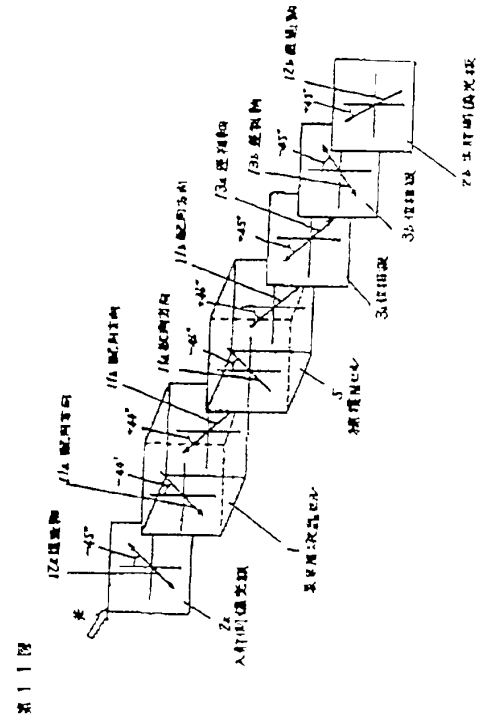
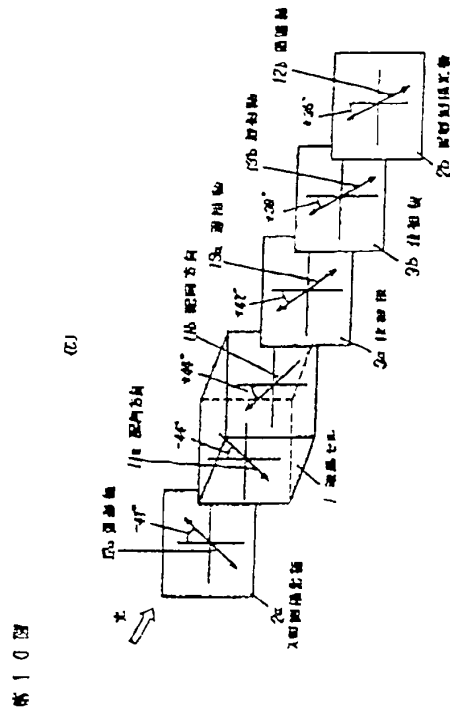
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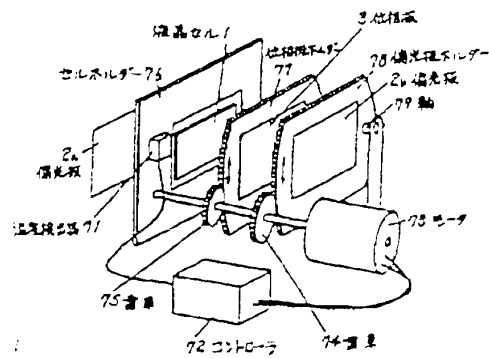
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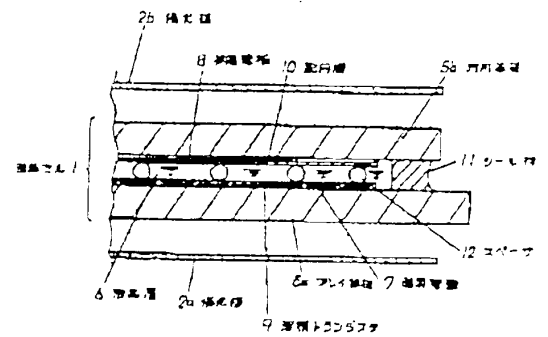
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第 1 2 図

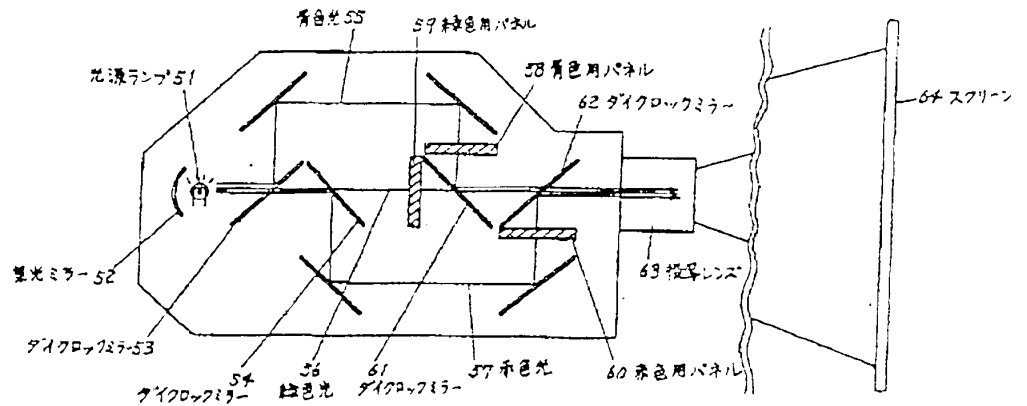


第 1 4 図

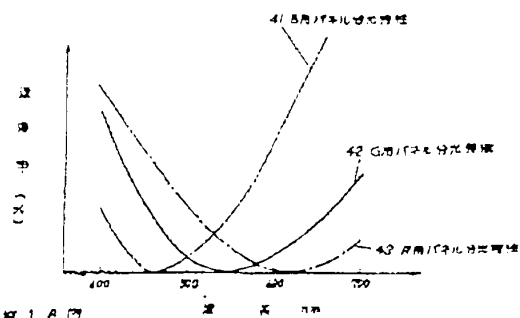


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第 13 図



第 15 図



第 16 図

